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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/665,313	09/11/2003	Michael Goldstein	Intel 10559-869001 / P173	5451
20985	7590	11/07/2005	EXAMINER	
FISH & RICHARDSON, PC P.O. BOX 1022 MINNEAPOLIS, MN 55440-1022			TUROCY, DAVID P	
			ART UNIT	PAPER NUMBER
			1762	

DATE MAILED: 11/07/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/665,313

Applicant(s)

GOLDSTEIN, MICHAEL

Examiner

David Turocy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 26 October 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-6,8,9,11 and 12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6,8,9,11 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☐ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Response to Amendment***

1. The indicated allowability of claims 1-6, 8-9, and 11-12 is withdrawn in view of the reconsideration to spraying the carbon dioxide within the lithography tool.

Rejections based on the reconsiderations follow.

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1-2, 4, 6, 8-9, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6444984 by Lundgren et al., hereafter Lundgren in view of US Patent 6619903 by Friedman et al., hereafter Friedman and further in view of US Patent 6387602 by Hayden et al, hereafter Hayden in view of US Patent Publication 2004/0185682 by Foulke et al., hereafter Foulke.

Lundgren discloses spraying carbon dioxide snow onto the surface of a transmissive substrate to form a solid carbon dioxide layer on the surface, which is cooled below the sublimation temperature of the carbon dioxide prior to forming the layer (abstract, Column 6, lines 58-63). The carbon dioxide coating as taught by Lundgren inherently prevents particles from contacting the surface. Lundgren discloses

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the substrate is in a carrier maintained at a temperature below the sublimation temperature of carbon dioxide (Column 6, lines 58-63). Lundgren discloses applying the carbon dioxide coating within the tool used to direct radiation. Lundgren discloses raising the temperature around the substrate above the carbon dioxide sublimation temperature to remove the coating from the substrate (Column 7, lines 35-40).

Lundgren fails to disclose applying the carbon dioxide film to a reticle. However, Friedman discloses transmissive substrates, such as reticles, are often used in lithography tools (Column 1, lines 18-21). Friedman discloses reticles, which are within an enclosure, are transported in a carrier and then inserted within the lithography tool (Column 2, lines 23-44).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lundgren to use a transmissive reticle within a lithography tool as suggested by Friedman to provide a desirable carbon dioxide coating on a substrate because Lundgren discloses applying a solid carbon dioxide film onto the surface of a transmissive substrate and Friedman discloses reticles, which are used in lithography tools, are known transmissive substrate.

Lundgren in view of Friedman fails to disclose spraying the reticle with carbon dioxide within the lithography tool.

However, Hayden discloses a method for cleaning the surface of the reticle inside a lithography tool (Column 2, lines 30-45). Hayden discloses providing a coating station within the lithography tool to eliminate the necessity to maintain a clean room

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(Column 2, lines 30-45). In addition, Foulke, teaching a method for cleaning reticles, discloses using a clean stream of carbon dioxide to remove any particles on the surface of the reticle (paragraph 0032).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lundgren in view of Friedman to clean the reticle in the lithography tool as suggested by Hayden by using the carbon dioxide spray cleaning as suggested by Foulke to provide a desirable cleaning of a reticle because Hayden discloses cleaning in the lithography tool provides the advantage of eliminating the necessity to maintain a clean room and Foulke discloses carbon dioxide spray is known in the art to provide removal of particles and/or contamination from the reticle and therefore would reasonably be expected to effectively provide cleaning within the lithography tool.

Claim 11: Lundgren in view of Friedman, Hayden and Foulke fails to disclose reflecting radiation off of the surface of the reticle in a lithography tool.

Friedman discloses using transmissive reticles within a lithography tool to transfer a desired pattern onto a substrate by allowing lithographic wavelengths to pass through (Column 1, lines 18-23). Friedman discloses also using reflective reticles in place of transmissive reticles within a lithograph tool (Column 1, lines 45-48). Friedman discloses reflective reticles are used for short wavelengths, which would otherwise be absorbed by the transmissive reticle (Column 1, lines 45-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lundgren in view of Friedman and further in view of Hayden and Foulke to use the reflective reticle as suggested by Friedman to provide a desirable reflection of wavelengths within a lithography tool because Lundgren in view of Friedman and further in view of Hayden and Foulke discloses coating a transmissive reticle and Friedman discloses reflective reticles are known in the art as substitutes for transmissive within a lithography tool.

4. Claim 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lundgren in view of Friedman, Hayden and Foulke as applied to claim 1 above and further in view of Applied Surface Technologies.

Claim 3: Lundgren in view of Friedman and further in view of Hayden and Foulke fails to discloses spraying carbon dioxide snow at a grazing angle with respect to the surface. However, Applied Surface Technologies discloses cleaning glass and optical surfaces to remove contamination before applying a coating to the surface (Glass and Optics, paragraph 1). Applied Surface Technologies discloses aiming the carbon dioxide snow nozzle at an angle so that the contamination removed does not land on the cleaned area (Cleaning Issues, Methods). Therefore, Applied Surface Technologies discloses the angle of spray is a result effective variable.

Therefore it would have been obvious to one skill in the art at the time of the invention was made to determine the optimal value for the spraying angle, including at a grazing angle, used in the process of Lundgren in view of Friedman and further in view of Applied Surface Technologies, through routine experimentation, to effectively prevent the removed contaminants from redepositing on the surface of the substrate.

5. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lundgren in view of Friedman, Hayden and Foulke as applied to claim 1 above and further in view of US Patent 4806455 by LaBianca, hereafter LaBianca

Lundgren in view of Friedman, Hayden and Foulke teaches all the limitations of these claims as discussed above. However, they fail to disclose spraying the carbon dioxide snow at a substantially 90-degree angle with respect to the surface of the reticle.

However, LaBianca discloses spraying at 90 degrees relative to the surface of a substrate is a known method of providing a coating on a substrate (Figure 3).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lundgren in view of Friedman, Hayden and Foulke to spray the coating at 90 degrees relative to the substrate surface as suggested by LaBianca to provide a desirable coating on a substrate because LaBianca discloses spraying at 90 degrees relative to the surface is known in the art to provide coating on a

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substrate and therefore would reasonably be expected to effectively provide a carbon dioxide coating on a reticle.

6. Claim 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Lundgren in view of Friedman, Hayden and Foulke as applied to claim 11 above and further in view of US Patent 6835503 by Krauth, hereafter Krauth.

Lundgren in view of Friedman, Hayden and Foulke teaches all the limitations of these claims as discussed above. However, they fail to disclose reflecting extreme ultraviolet radiation off of the surface of the reticle in a lithography tool.

However, Krauth discloses that it is known in the art to reflect extreme ultraviolet radiation using a reticle within a lithography tool (Column 1, lines 13-46). Krauth discloses that the wavelength of light transmitted through or reflected by the reticle is critical during the lithography process (Column 1, lines 26-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Lundgren in view of Friedman, Hayden and Foulke to reflect extreme ultraviolet radiation as suggested by Krauth because Krauth discloses reflective reticles are known in the art to reflect extreme ultraviolet radiation in a lithography tool and Lundgren in view of Friedman, Hayden and Foulke discloses using a reflective reticle within a lithography tool and therefore would reasonably be expected to effectively reflect extreme ultraviolet radiation.



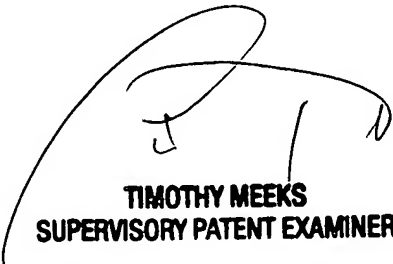
***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Turocy whose telephone number is (571) 272-2940. The examiner can normally be reached on Monday-Friday 8:30-6:00, No 2nd Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

David Turocy  
AU 1762



**TIMOTHY MEEKS**  
**SUPERVISORY PATENT EXAMINER**